Leopards in the city

Nikit Surve interviewed by Parikshit Suryavanshi
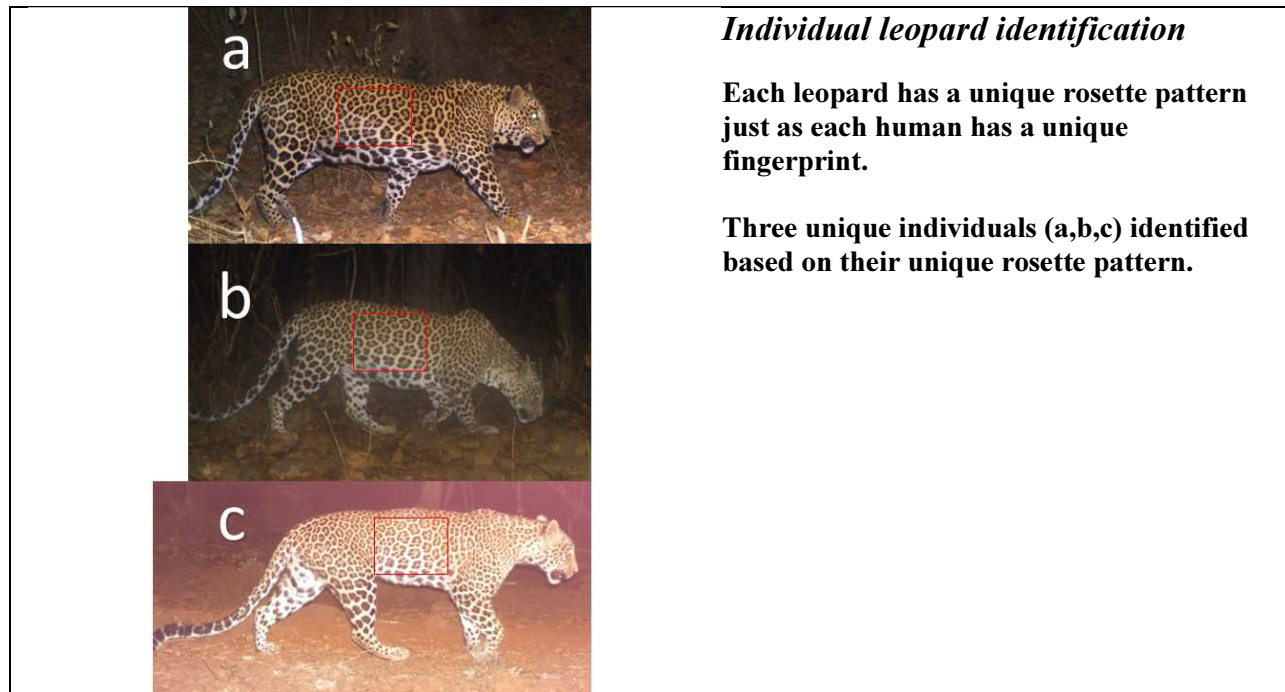

The uncrowned king of SGNP
The luminous city behind it makes a perfect background for 'The Leopard of Mumbai'.

Nikit Surve, a Mumbai resident, as part of his master's degree at the Wildlife Institute of India (WII), Dehradun, undertook a research project on leopards (*Panthera pardus fusca*) in Sanjay Gandhi National Park, Mumbai, in collaboration with the Maharashtra Forest Department. The research covering a total area of roughly 140 sq km found 35 leopards in and around the park including the Aarey colony, i. e. a density of 22 leopards/100 sq.km plus or minus 5.

Here, Nikit Surve, a young wildlife biologist shares with us his wonderful experiences with the miraculous wildlife of SGNP and incredible facts about leopards that manage to thrive in the heart of the densely populated Mumbai!

NIKIT, WE ARE SO CURIOUS, PLEASE TELL US HOW DO YOU INDENTIFY INDIVIDUAL LEOPARDS?

At the finalized location we set two camera traps opposite to each other to get both flank images of the leopards. These cameras face each other but at a slight angular difference to avoid both the cameras getting triggered at the same time. Every leopard has a unique rosette pattern. This rosette pattern is different on the left and right flank, just as our fingerprints of the left-hand don't match with that of the right. Hence it is important to get images of the both flanks. Once we get the leopard images we compare each image with all other images based on the rosette pattern.

Individual leopard identification

Each leopard has a unique rosette pattern just as each human has a unique fingerprint.

Three unique individuals (a,b,c) identified based on their unique rosette pattern.

THUS YOU FOUND EXACTLY 35 LEOPARDS?

The number is 35 plus or minus 1. It has been done using a scientific method which is difficult to explain here due to its technical nature. We used Mark Capture Recapture method (Spatially Explicit Capture Recapture model). Let's say, there is a pond with fish. We put a net into the pond, catch some fish, mark and release them into the pond. We again catch some fish using the net. This time we will have some marked and some unmarked fish. Based on the recapture probability we calculate the total number of fish.

In case of leopards, we use their unique individual rosette pattern as a mark and use the same method with the help of camera trap images. Information thus received is transformed into a statistical format and fed into a software. Once we feed all data the software does the calculations and analysis. Thus it gave us a number of 35 with a standard error of 0.5 (plus or minus 0.5). We got 88 images of leopards in all.

SOUNDS GREAT, BUT HOW DID YOU DECIDE LOCATIONS OF THE CAMERA TRAPS?

Setting camera needs special training. Many things like perfect height from the ground, angles of opposite cameras, animal's paths, water bodies etc. are taken into account

We had to rely on indirect evidences such as scat, pugmarks, scrapes etc. In the initial months of December and January we only walked, walking one or two forest beats daily. Equally important, local people knew very well the paths leopards used, where they drank water etc. Once we knew the leopards' trails, we selected locations from where camera traps would not be easily stolen.

THIS MUST HAVE NEEDED YOU TO WIN THE CONFIDENCE OF THE LOCAL PEOPLE.
Of course, local people's support was absolutely necessary. Beat guards and *Van majurs* were my companions in this project. We would walk together, eat together and do our work of searching for indirect evidences together. It helped strengthen our bonds. Also all the leopards we got pictures of, we named them after discussion with the locals. They would often refer to these leopards as "our leopards".

NAMING LEOPARDS! SEEMS INTERESTING! PLEASE GIVE US SOME EXAMPLES

CHANDANI (MOONLIGHT): Chandani was captured by a camera placed next to a house occupied by a grandmother. Post field work, I would sit in her verandah, gossip with her, show her the images. She would say that tribals believed that "Leopards roam on starry nights, so on these nights we should not move out" (starry night signified no moon night/*Amavas*).

BHOOTYA (THE GHOST): We put two cameras opposite each other to capture both flanks. This leopard would get captured in one camera and not in the other! This happened two-three times so we named it – Bhootya!

Mastikhor
On its very first encounter with the camera this leopard played with it and tried to bring it down. So it was called Mastikhor – the mischief maker!

MASTIKHOR (MISCHIEF MAKER): On his very first encounter with the camera this leopard brought the camera down. When I looked at the images closely I noticed that this leopard is looking at the camera. Most probably the very next moment he must have gone there and slapped the camera. We named it Mastikhor - the mischief maker!

FASCINATING STORIES INDEED! COULD YOU KINDLY SHARE SOME OF YOUR FAVOURITE IMAGES

There are two-three images with interesting stories.

CITY BEHIND LEOPARD (THE BIG DADDY): In 2012, while volunteering on the project, "Mumbaikars for SGNP", I was responsible for a camera trap located at higher ground. I would imagine that one day I will capture an iconic image in which the sprawling city will be seen behind a leopard. When time came to do my own project I selected that location as I knew that path was used by a leopard. It was summer, and a fire had burnt a sort of window with grass on both sides. After 2-3 days of setting up the camera I got that image of my dreams. I was thrilled beyond words. This image has become the iconic image for 'Leopards of Mumbai'.

He is a big muscular male, we called him "Big Daddy".

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'Leopard of Mumbai'
To get this image was a long cherished wish of Nikit.
The iconic photograph received immense fame as the 'Leopard of Mumbai' in media.
It was named as "Big Daddy" due to its muscular built.

THE FLYING LEOPARD: Some animals are camera-shy. When this leopard came near, one of the cameras flashed, the leopard was terrified and as it ran away the second camera captured it with three legs in the air! We named him Bhitrya– meaning timid in Marathi.

This is a camera-shy leopard. It ran away when a camera flashed to take its photo.
*Its timidity gave it a name – **Bhitrya meaning timid in Marathi!***

ON ONE HAND A LEOPARD AVOIDS HUMANS AND ON THE OTHER IT COMES INTO HUMAN DOMINATED AREAS? HOW IS IT?

The leopard avoids detection by humans but it doesn't avoid coming into human-dominated areas. It knows exactly when is the right time to show up, do its job and not get detected. Leopards have been living in close proximity of humans and they have adapted well to survive with them without being detected. And the answer is pretty simple; the leopard comes into human dominated areas for 'easy and abundant' prey.

WITH BEAUTIFUL IMAGES, THERE MUST BE MEMORABLE EXPERIENCES OF THE PROJECT, PLEASE SHARE

I never saw a leopard when I went looking for it. I only saw them thrice during my entire study but I am pretty sure they must have seen me on many occasions. Simple reason behind this is that the leopard is a master of camouflage and knows very well how to avoid humans. Once while walking on the plateau above Kanheri caves we spotted a leopard at a distance, what an amazing scene it was! It looked nothing larger than a crow but we could see a beautiful silhouette against the backdrop of the setting sun. I can never forget that sighting.

ANY OTHER MOVING MEMORY?

One of my field assistants, a *Van majur* worked in the forest department nursery. During the project he arrived daily at 5 am and left only around 8 pm. When I asked him why he was working so hard he said, "I love to go into jungle. I am so happy to have this opportunity, otherwise I would have remained at the nursery only". Even the sight of a monkey would excite him. He was married and had two children, his earnings barely made ends meet, however he was not worried about the future and worked with great passion and dedication. Here, I feel it is important to recognize people, let them follow their passion and they will do wonderful work. He will always inspire me.

YES QUITE INSPIRING, YOU TOO LOVE WHAT YOU ARE DOING, HOW DID YOU DECIDE TO STUDY WILDLIFE?

I was interested in wildlife since my childhood, I would enjoy watching sparrows or even street dogs. Going to the zoo was always the most exciting vacation activity. I was lucky to have got the right mentors at the right time, starting from my mother to my relatives, my school and college teachers who always supported and encouraged me.

AND HOW WAS YOUR EXPERIENCE OF WORKING WITH THE FOREST DEPARTMENT

This was a collaborative project, with the Forest Department having an equal contribution. We had a number of workshops in which I trained beat guards on conducting line transects, camera trapping, on installing, switching on and off the camera etc. The forest staff was always with me on field.

Camera traps were set and notes were taken meticulously

We used to set up 10-15 cameras at a time. I would make one beat guard responsible for one camera location. I visited each location every two-three days, I would go with someone in the morning and someone else in the evening to make them feel they are not alone. This is how we worked. It was a wonderful experience to work with them, I learnt a lot from them. *Van majurs* are the ground staff and we rarely interact with them but believe me there is a lot to learn from them. I thank them for sharing every bit of information they had and for accepting me as part of their group. At the end of a hard day's work we would sit down to wonderful food they had cooked.

HOW WAS YOUR REPORT RECEIVED BY THE FOREST DEPARTMENT, MEDIA AND PUBLIC?

Everyone received it positively. The forest department was happy with it as we had a baseline data ready on leopards and their prey for future monitoring. Earlier the leopard was reported negatively in media as dangerous, man eater, dog slayer etc. accompanied with snarling ferocious pictures. But after this report, at least for a whole week, a number of good articles with beautiful pictures of leopards were published in the media. I thank the media for the same. This positive publicity is good for the conservation of leopards.

HOW DO YOU THINK THIS STUDY WILL HELP BETTER CONSERVATION AND MANAGEMENT OF LEOPARDS OF SGNP?

This data serves as the baseline data on the leopard and prey population of SGNP and hence will help in further monitoring and comparisons of populations. This study also involved a lot of forest department staff, this helps in capacity building. Further monitoring will help us know about the leopard movement inside as well as outside the park.

WHAT WILDLIFE ISSUES ARE YOU PLANNING TO WORK ON IN THE FUTURE?

Studying human wildlife interactions and working towards resolving the negative ones. We need to learn to share spaces with wildlife as they are already doing their bit.

The study also found a healthy presence of several wild species like common Langur, bonnet Macaque, chital and sambar which constitute the wild prey base of leopards. Dogs on the periphery of SGNP which form a substantial part (24.46%)* of the leopard's diet were found to be present at a density of 17-18/sq.km.

Food habits of leopards were studied by conducting dietary analysis using leopard scat. The study suggests that the leopards are dependent on both wild as well as domestic prey in the study area. Leopards can share spaces with humans even amidst urban environs as long as prey population (both domestic and wild) remain sufficient and their habitat is protected. Not a single attack on humans was reported during the study period despite leopard visitations in the surrounding areas.

Nikit, washing leopard scat under running water.
Diet analysis was conducted using undigested material from leopard scats like hair, nails and claws.

* Although the frequency of occurrence of dogs was shown to be highest among all other prey species we cannot conclude about the contribution of dogs in leopard's diet. The reason for this being, frequencies of the identifiable prey remains in the scat do not tell us about the actual proportion of prey type eaten. This is more so when the prey items vary in size to a considerable degree. Smaller prey species have more undigested material (hair) due to higher body surface to mass ratio.

The percentage contribution reported is in terms of relative biomass consumed.

Nikit Surve

All Photos courtesy: **Nikit Surve/SGNP/WII/WCS**

Ref. ECOLOGY OF LEOPARD IN SANJAY GANDHI NATIONAL PARK, MAHARASHTRA WITH SPECIAL REFERENCE TO ITS ABUNDANCE, PREY SELECTION AND FOOD HABITS

A report *by*
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